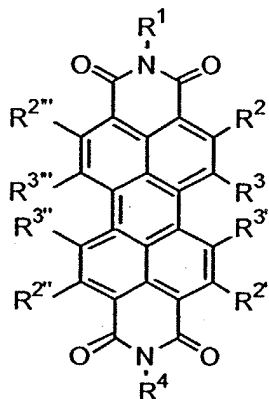


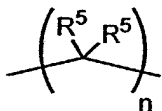
What is claimed is:

1. A method of reducing proliferative capacity of a cell comprising contacting said cell with a compound or a salt thereof or a stereoisomer of compound I that has the formula:

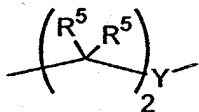


I

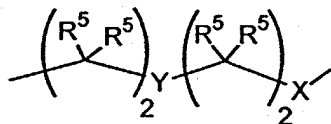
where R^1 and R^4 are independently -L-A where L is a linking group having the formula:



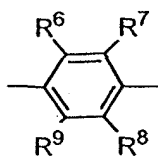
where n is 1-3; and each R5 is independently H, Me, OH, or OMe;



where R5 is as before and Y is O, S, SO, SO2, NH, NMe, or NCOMe;

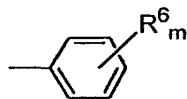


where R⁵ and Y are as before and X is CH₂, O, S, SO, SO₂, NH, NMe, or NCOMe;

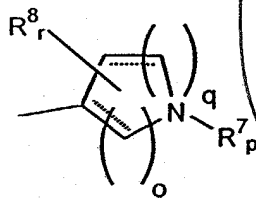


where R⁶, R⁷, R⁸, and R⁹ are independently H, OMe, OEt, halogen, or Me;

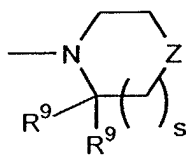
and A is a compound of the formula:



where m is 0-5 and R⁶ is halogen, NH₂, NO₂, CN, OMe, SO₂NH₂, amidino, guanidino, or Me;

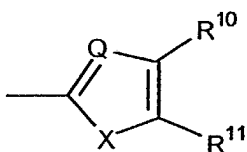


where o is 0-1; p is 0-2; q is 1-2 provided that when o + q is 2, in which case a pyrrolidine or pyrrole ring is indicated, or 3, in which a piperidine or pyridine ring is indicated; r is 0-3; R⁷ is H or Me; R⁸ is independently Me, NO₂, OH, CH₂OH or halogen, and when r is 2-3, two adjacent R⁸ substituents are -(CH=CH)₂- or -(CH₂)₄- to form an annulated six-membered ring;



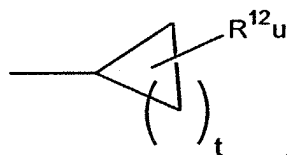
where R^9 is independently H, Me, and when R9 is O; s is 0-1; Z is CH_2 , O, NH, NMe, NEt, N(Me)₂, N(Et)₂, or NCO₂Et;

5

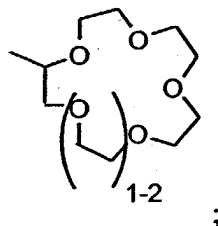
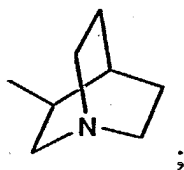


where Q is N, CH, NMe, or NEt; X is O, S, NH, NMe or NEt; R^{10} and R^{11} are independently H, Me, CH_2CO_2Et , R^{10} and R^{11} taken together are $-(CH=CH)_2-$ or $-(CH_2)_4-$;

10



where t is 1-4; u is 0-4, and R^{12} is independently Me, OH,



15

CO₂R¹³, CON(R¹³)₂, SO₃H, SO₂N(R¹³)₂, CN, CH(CO₂R¹³)₂, CH(CON(R¹³)₂)₂,
N(R¹³)₂, or N(R¹³)₃ where R¹³ is H, Me, Et, or CH₂CH₂OH; and
R², R^{2'}, R^{2''}, R^{2'''}; R³, R^{3'}, R^{3''}, R^{3'''} are each independently H, OMe, halogen, or
NO₂.

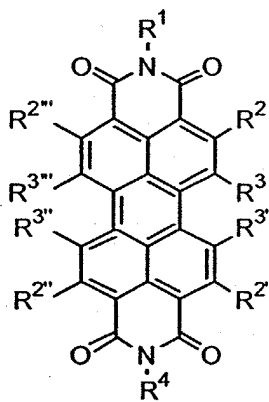
- 5
2. The method of claim 1, wherein the cell is a mammalian cell.
3. The method of claim 1, wherein the cell is a human cell.
- 10 4. The method of claim 1, wherein the cell is a cancer cell.
5. The method of claim 1, wherein said malignant cell is a breast cancer cell,
a prostate cancer cell, liver cancer cell, a pancreatic cancer cell, a lung cancer cell, a brain
15 cancer cell, an ovarian cancer cell, a uterine cancer cell, a testicular cancer cell, a skin
cancer cell, a leukemia cell, a head and neck cancer cell, an esophageal cancer cell, a
stomach cancer cell, a colon cancer cell, a retinal cancer cell, a bladder cancer cell, an
anal cancer cell and a rectal cancer cell.
- 20 6. A method of reducing telomeric extension comprising administering a
compound of claim 1 to a telomerase in the presence of a telomerase substrate.
7. The method of claim 6, where the telomerase is in a cell.
- 25 8. The method of claim 1, wherein said compound further promotes
apoptosis.
9. The method of claim 1, wherein said compound further promotes
apoptosis in a cell.

10. The method of claim 1, wherein the compound is a perylene compound.

11. The method of claim 1, wherein the compound is N,N'-bis(2-piperdinoethyl)-3,4,9,10-perylenetetracarboxylic acid diimide.

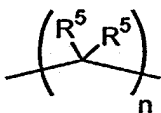
12. The method of claim 1, wherein the compound is N,N'-bis(2-dimethylaminoethyl)-3,4,9,10-perylenetetracarboxylic acid diimide.

13. A compound of the formula

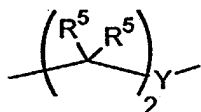


I

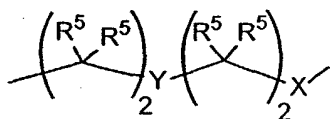
where R^1 and R^4 are independently -L-A where L is a linking group having the formula:



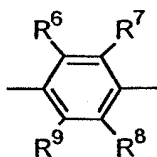
where n is 1-3; and each R⁵ is independently H, Me, OH, or OMe;



where R⁵ is as before and Y is O, S, SO, SO₂, NH, NMe, or NCOMe;

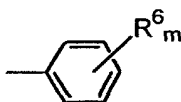


5 where R⁵ and Y are as before and X is CH₂, O, S, SO, SO₂, NH, NMe, or NCOMe;

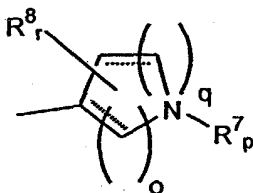


10 where R⁶, R⁷, R⁸, and R⁹ are independently H, OMe, OEt, halogen, or Me;

and A is a compound of the formula:

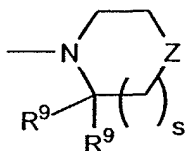


15 where m is 0-5 and R₆ is halogen, NH₂, NO₂, CN, OMe, SO₂NH₂, amidino, guanidino, or Me;



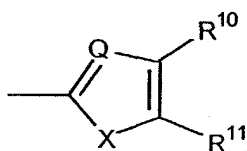
20 where o is 0-1; p is 0-2; q is 1-2 provided that when o + q is 2, in which case a pyrrolidine or pyrrole ring is indicated, or 3, in which a piperidine or pyridine ring

is indicated; r is 0-3; R^7 is H or Me; R^8 is independently Me, NO_2 , OH, CH_2OH or halogen, and when r is 2-3, two adjacent R^8 substituents are $-(CH=CH)_2-$ or $-(CH_2)_4-$ to form an annulated six-membered ring;



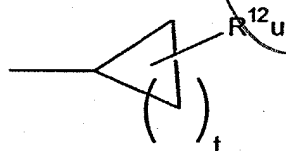
5

where R^9 is independently H, Me, and when R^9 is O; s is 0-1; Z is CH_2 , O, NH, NMe, NEt, $N(Me)_2$, $N(Et)_2$, or NCO_2Et ;



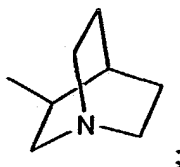
10

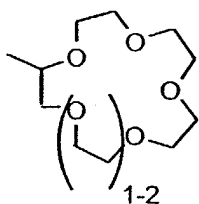
where Q is N, CH, NMe, or NEt; X is O, S, NH, NMe or NEt; R^{10} and R^{11} are independently H, Me, CH_2CO_2Et , R^{10} and R^{11} taken together are $-(CH=CH)_2-$ or $-(CH_2)_4-$;



15

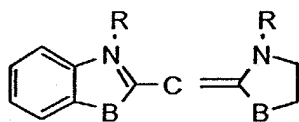
where t is 1-4; u is 0-4, and R^{12} is independently Me, OH,





CO₂R¹³, CON(R¹³)₂, SO₃H, SO₂N(R¹³)₂, CN, CH(CO₂R¹³)₂, CH(CON(R¹³)₂)₂, N(R¹³)₂, or N(R¹³)₃ where R¹³ is H, Me, Et, or CH₂CH₂OH; and R², R^{2'}, R^{2''}, R^{2'''}; R³, R^{3'}, R^{3''}, R^{3'''} are each independently H, OMe, halogen, or NO₂.

14. A method of reducing proliferative capacity of a cell comprising contacting said cell with a compound having the formula II or a salt thereof or a stereoisomer of said compound:



II

where C is -CH=CH-, -(CH=CH)₂-, -(CH=CH)₃-, p-phenylene, o-phenylene, p-phenylene-CH=CH-, or o-phenylene-CH=CH-; B is O, S, or NR, and R is r Me or Et.

15. The method of claim 14, wherein the cell is a mammalian cell.
16. The method of claim 14, wherein the cell is a human cell.
17. The method of claim 14, wherein the cell is a cancer cell.

18. The method of claim 14, wherein said cancer cell is a breast cancer cell, a prostate cancer cell, liver cancer cell, a pancreatic cancer cell, a lung cancer cell, a brain cancer cell, an ovarian cancer cell, a uterine cancer cell, a testicular cancer cell, a skin cancer cell, a leukemia cell, a head and neck cancer cell, an esophageal cancer cell, a

stomach cancer cell, a colon cancer cell, a retinal cancer cell, a bladder cancer cell, an anal cancer cell and a rectal cancer cell.

19. A method of reducing telomeric extension comprising administering a compound of claim 14, to a telomerase in the presence of a telomerase substrate.

20. The method of claim 19, where telomerase is in a cell.

21. The method of claim 14, wherein said compound further promotes apoptosis in a cell.

22. The method of claim 14, wherein the compound is a carbocyanine.

23. The method of claim 22, wherein the carbocyanine is 3,3'-diethyloxadicarbocyanine (DODC).

24. A method for identifying a candidate compound that inhibits telomerase activity, comprising the steps:

- a) obtaining the three-dimensional structure of a selected compound; and
- b) determining the complementarity of the compound to telomere DNA G-quadruplex

wherein a compound that exhibits at least 75% of the favourable intermolecular interaction energy of the perylene diimide 2-d(TTAGGG)₄ complex structure is indicated to inhibit telomerase activity.

25. A method of identifying a telomerase inhibitor comprising:

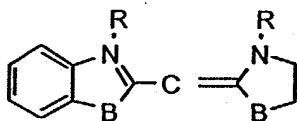
- a) contacting a compound with DNA G-quadruplex; and
- b) determining the melting point of the DNA G-quadruplex

wherein a compound exhibiting an increase in melting point of said quadruplex, relative to unbound DNA G-quadruplex, is indicated to inhibit telomerase activity.

26. A method of identifying a telomerase inhibitor comprising the steps:
a) preparing a DNA G-quadruplex/dye complex wherein the dye is bound with the G-quadruplex;
b) contacting said complex with a candidate compound; and
c) determining displacement of said dye in the complex by said candidate, wherein displacement of the dye identifies the candidate as a telomerase inhibitor.

27. A method of identifying a telomerase inhibitor comprising:
a) contacting a candidate compound to be identified as a telomerase inhibitor with DNA G-quadruplex; and
b) determining the fluorescence or UV/VIS spectrum of the compound wherein an increase or decrease of the UV/VIS absorption or fluorescence emission intensity of said compound relative to the UV/VIS absorption or fluorescence emission intensity in the absence of DNA-G-quadruplex indicates telomerase inhibitory activity of the compound.

28. A compound of the formula:



II

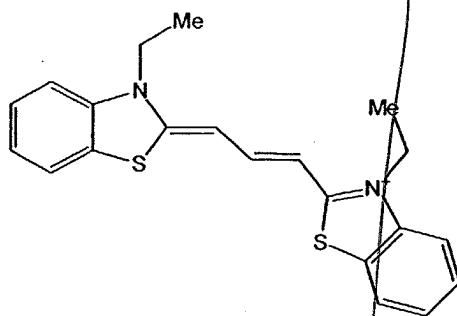
in which C is $-\text{CH}=\text{CH}-$, $-(\text{CH}=\text{CH})_2-$, $-(\text{CH}=\text{CH})_3-$, p-phenylene, o-phenylene, p-phenylene- $\text{CH}=\text{CH}-$, or o-phenylene- $\text{CH}=\text{CH}-$; B is O, S, or NR, and R is Me or Et.

Additional Claims:

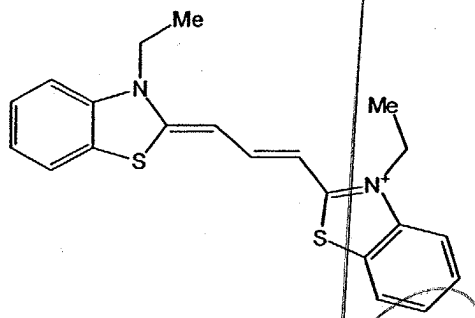
29. The method of claim 1, wherein the mitotic division of a cell is inhibited.

30. The method of claim 14, wherein the mitotic division of a cell is inhibited.

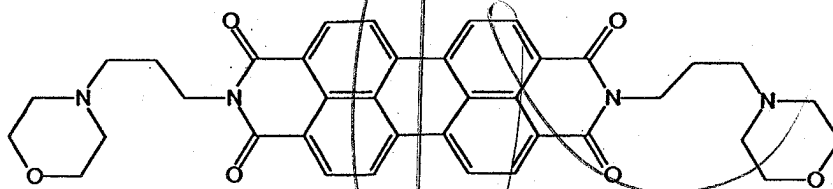
31. A compound of claim 28, having the structure:



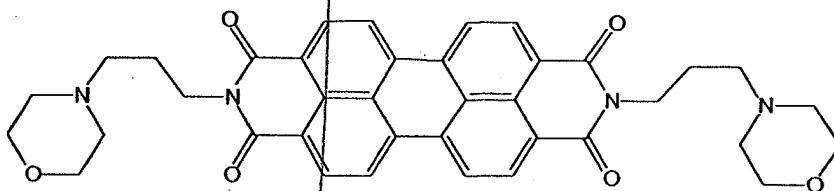
32. The method of claim 14, having the structure:



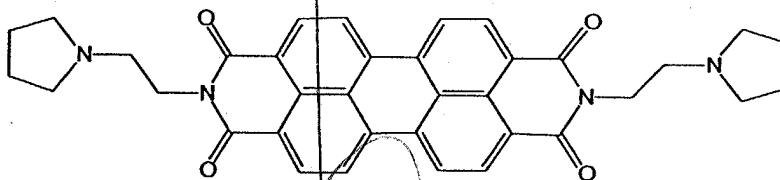
33. A compound of claim 13, having the formula:



34. The method of claim 1, having the formula:



35. The compound of claim 13, having the formula:



36. The method of claim 1, having the structure:

